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United States Patent [19]

Anthony et al.

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[45] **Date of Patent: Sep. 1, 1992**

[54] **BELT BUCKLE WITH INTERLOCKING DUAL TONGUE AND FLOATING PEG**

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[73] Assignee: **Indiana Mills and Manufacturing, Inc.**, Westfield, Ind.

[21] Appl. No.: **714,710**

[22] Filed: **Jun. 13, 1991**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 536,170, Jun. 11, 1990, Pat. No. 5,038,446, which is a continuation-in-part of Ser. No. 370,240, Jun. 22, 1989, Pat. No. 5,023,981.

[51] **Int. Cl.**[5] **A44B 11/25**

[52] **U.S. Cl.** **24/573.5**; 24/632; 24/642; 24/643

[58] **Field of Search** 24/573.5, 573.2, 573.1, 24/632, 642, 643, 636, 656, 641, 639, 652, 200, 199; 297/481

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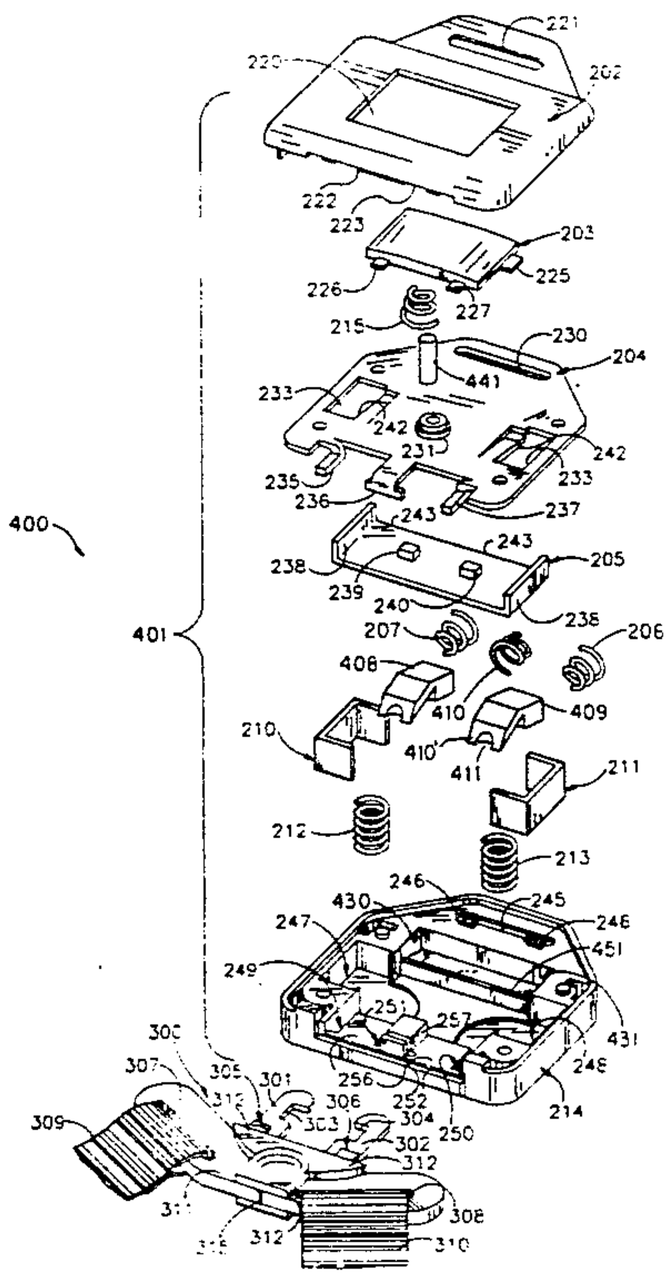
Attorney, Agent, or Firm—Woodard, Emhardt, Naughton Moriarty & McNett

[57] **ABSTRACT**

A seat belt buckle with a pair of buckle tongues. The buckle includes a spring mechanism movable within the buckle housing from a position blocking engagement of a latch when a single tongue is inserted to a position away from the latch when both tongues are inserted allowing the latch to engage the tongues. In one embodiment, a latch indicator is slidably mounted to the buckle push button in the buckle cover and includes a lower end contacting the latch. The indicator is movable from a position flush with the buckle push button when the latch is not engaged with the tongues to an upraised position over the button when the latch moves up and engages the tongues. The tongues have mating portions, but are separable.

13 Claims, 8 Drawing Sheets



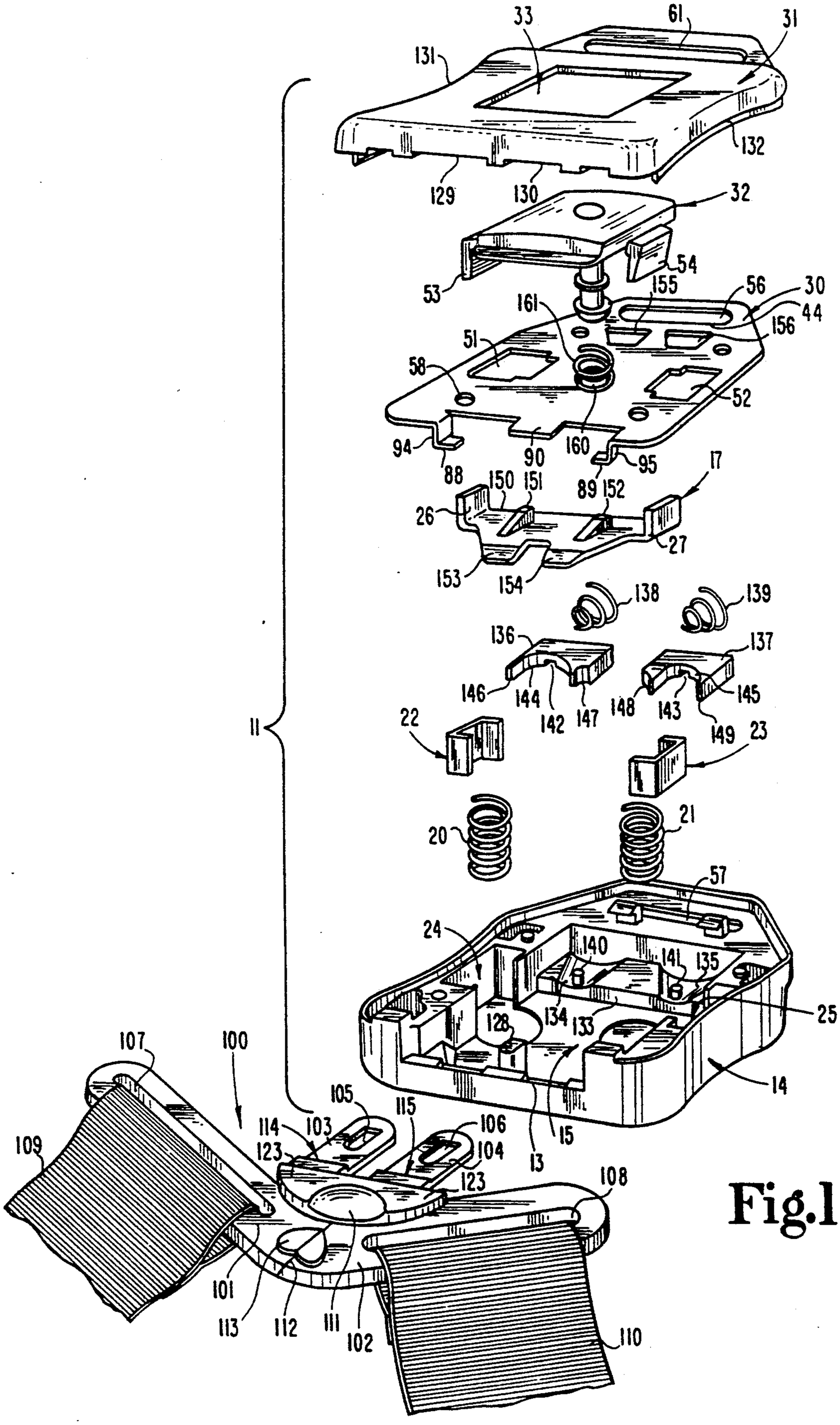

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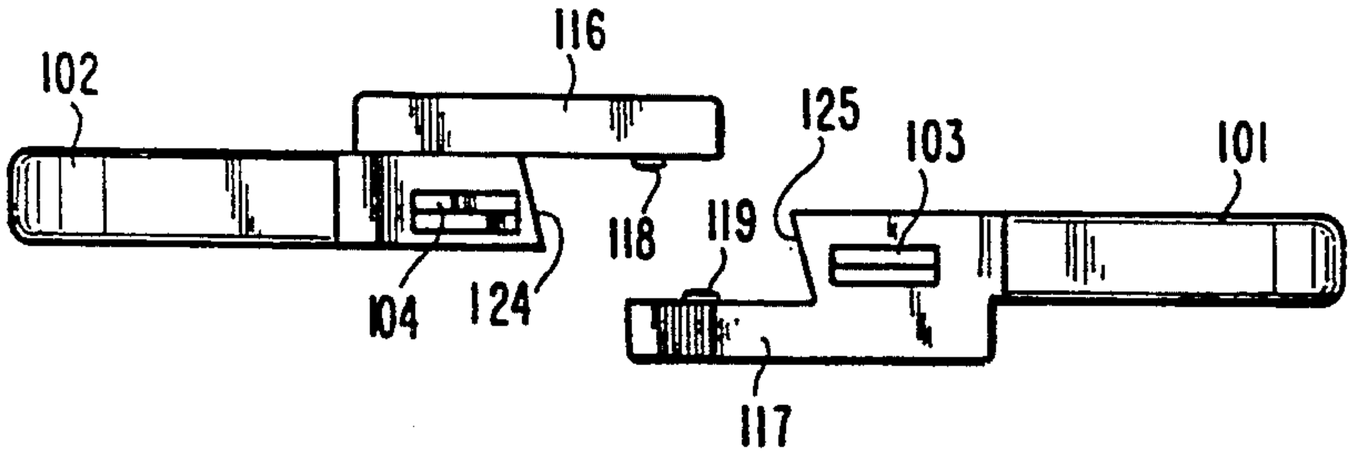
Fig.1



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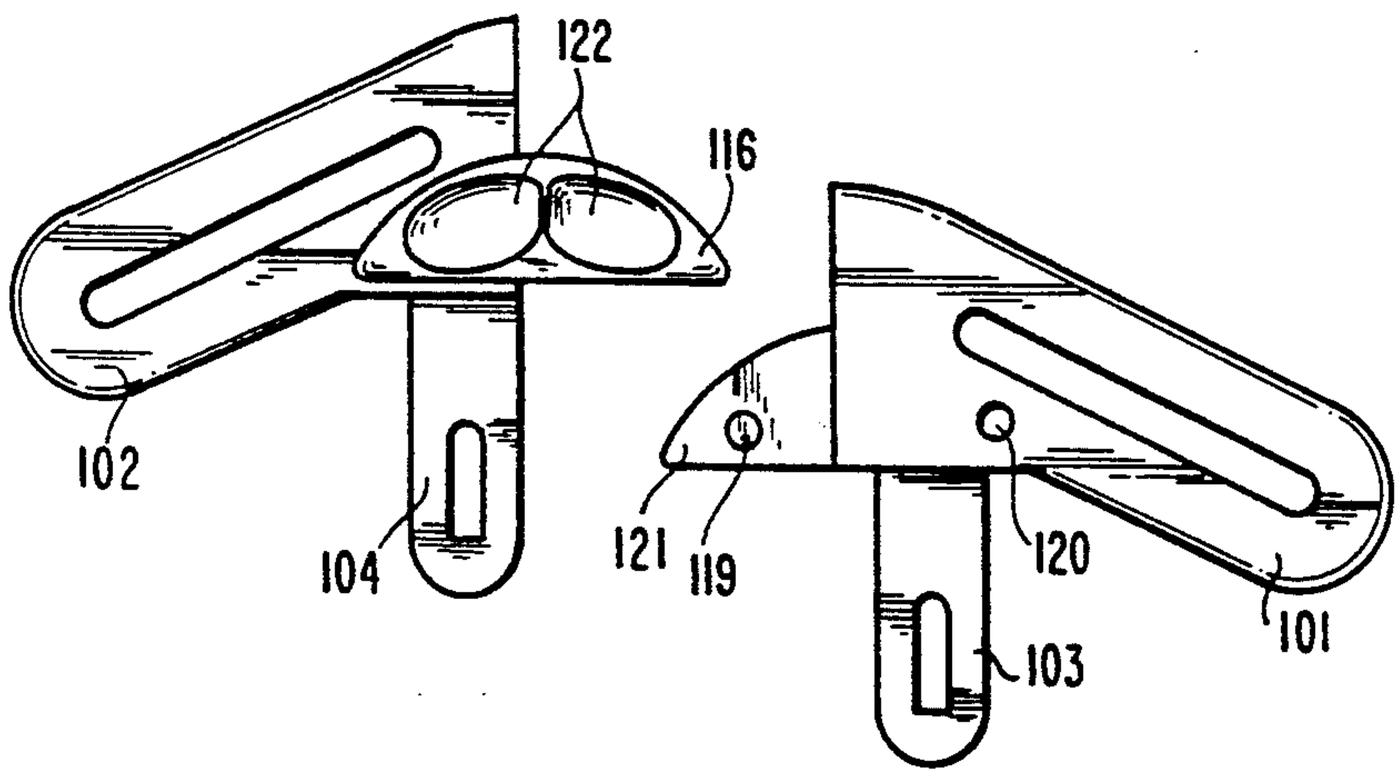

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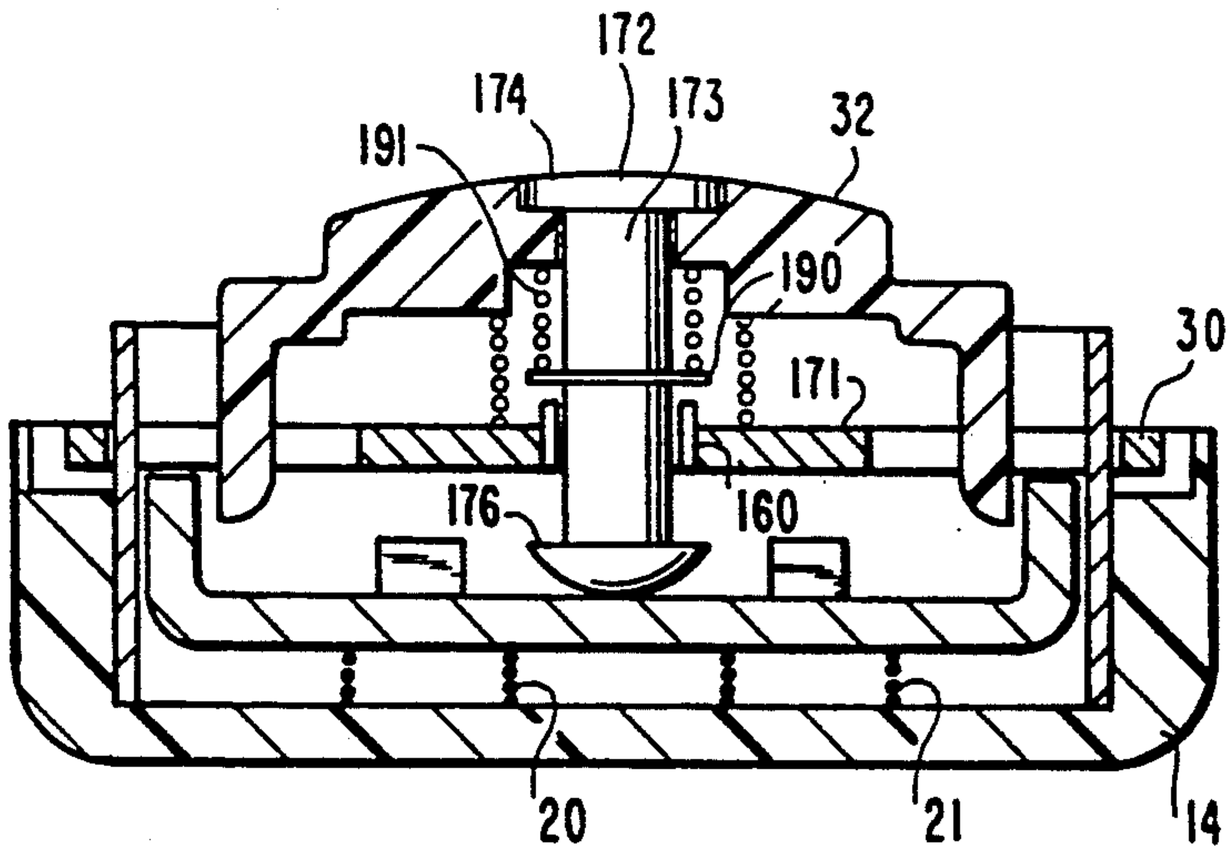

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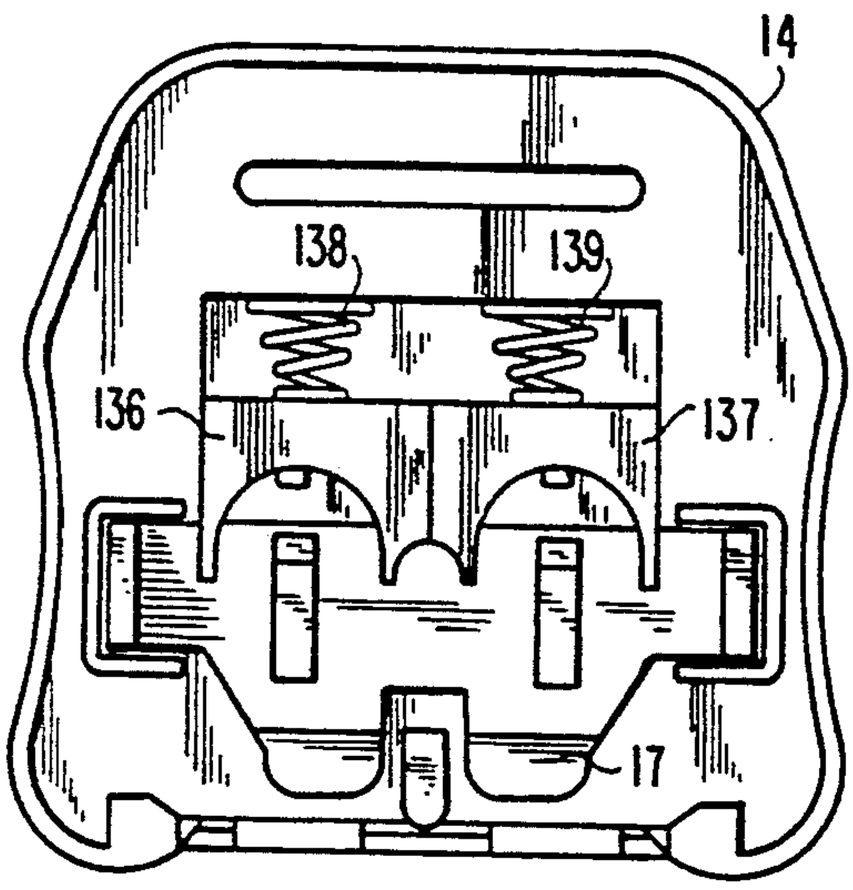

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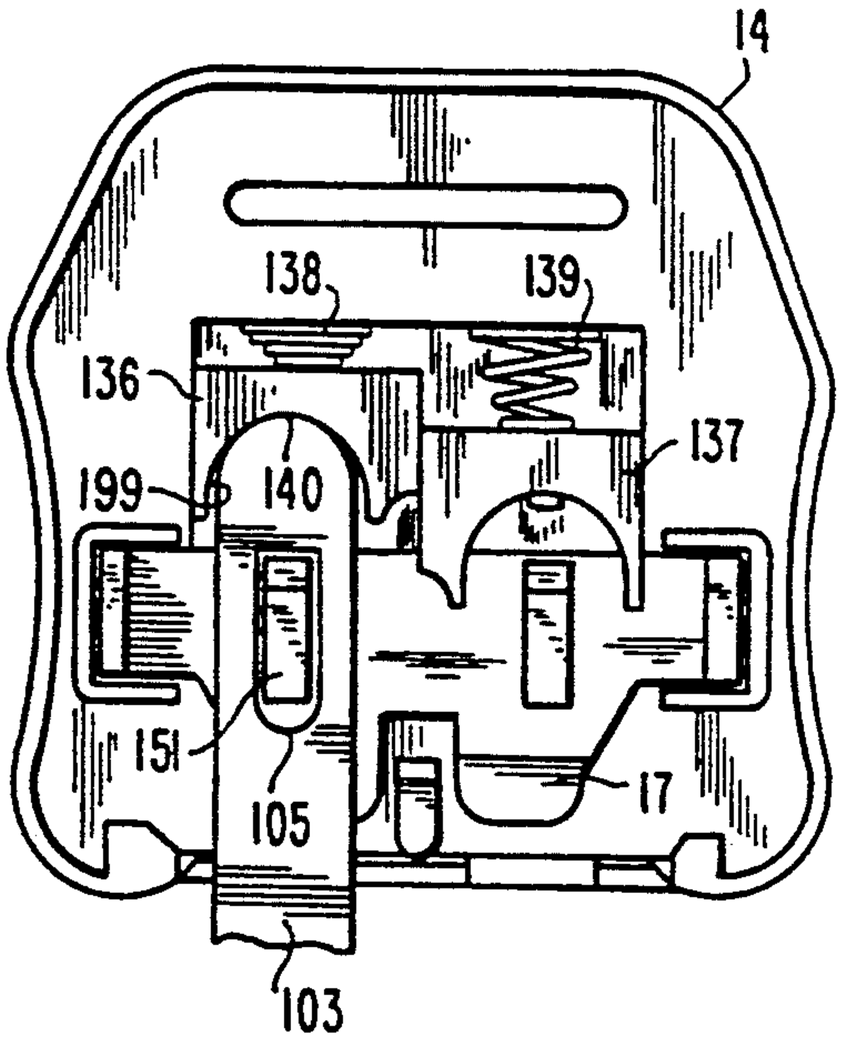

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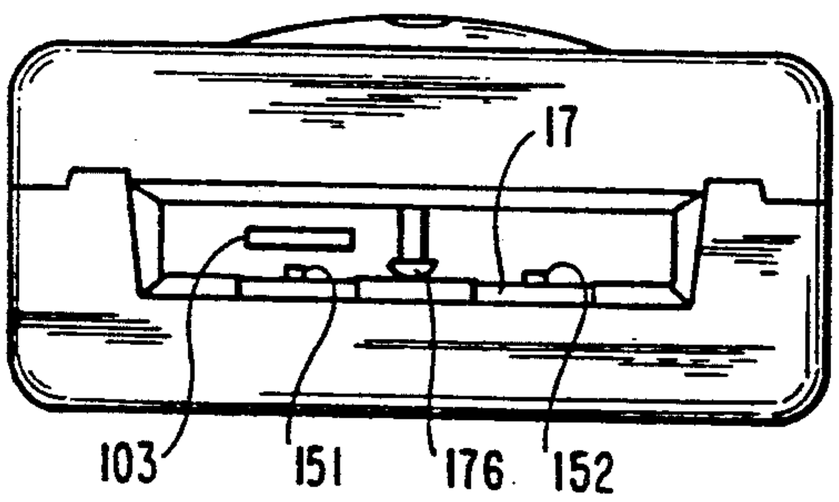
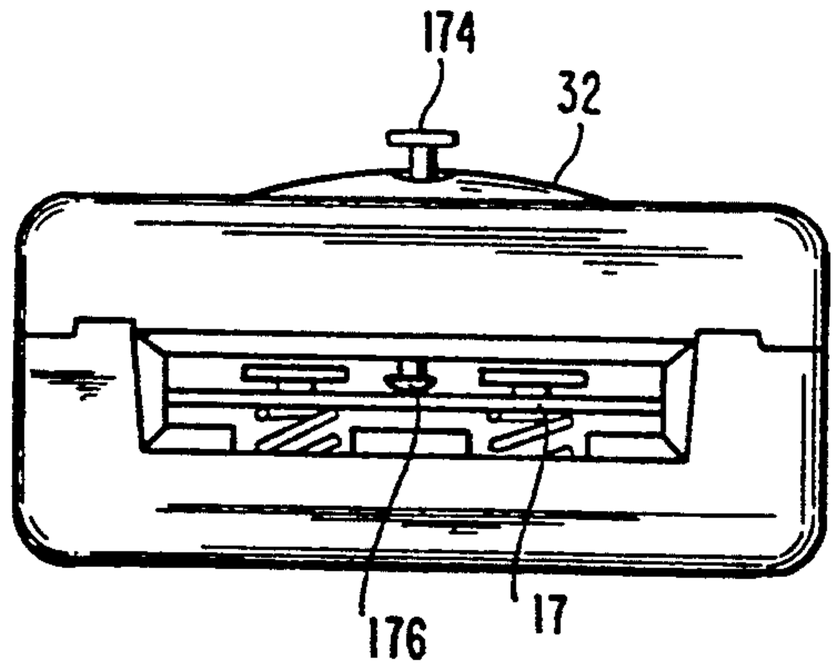


Fig. 7



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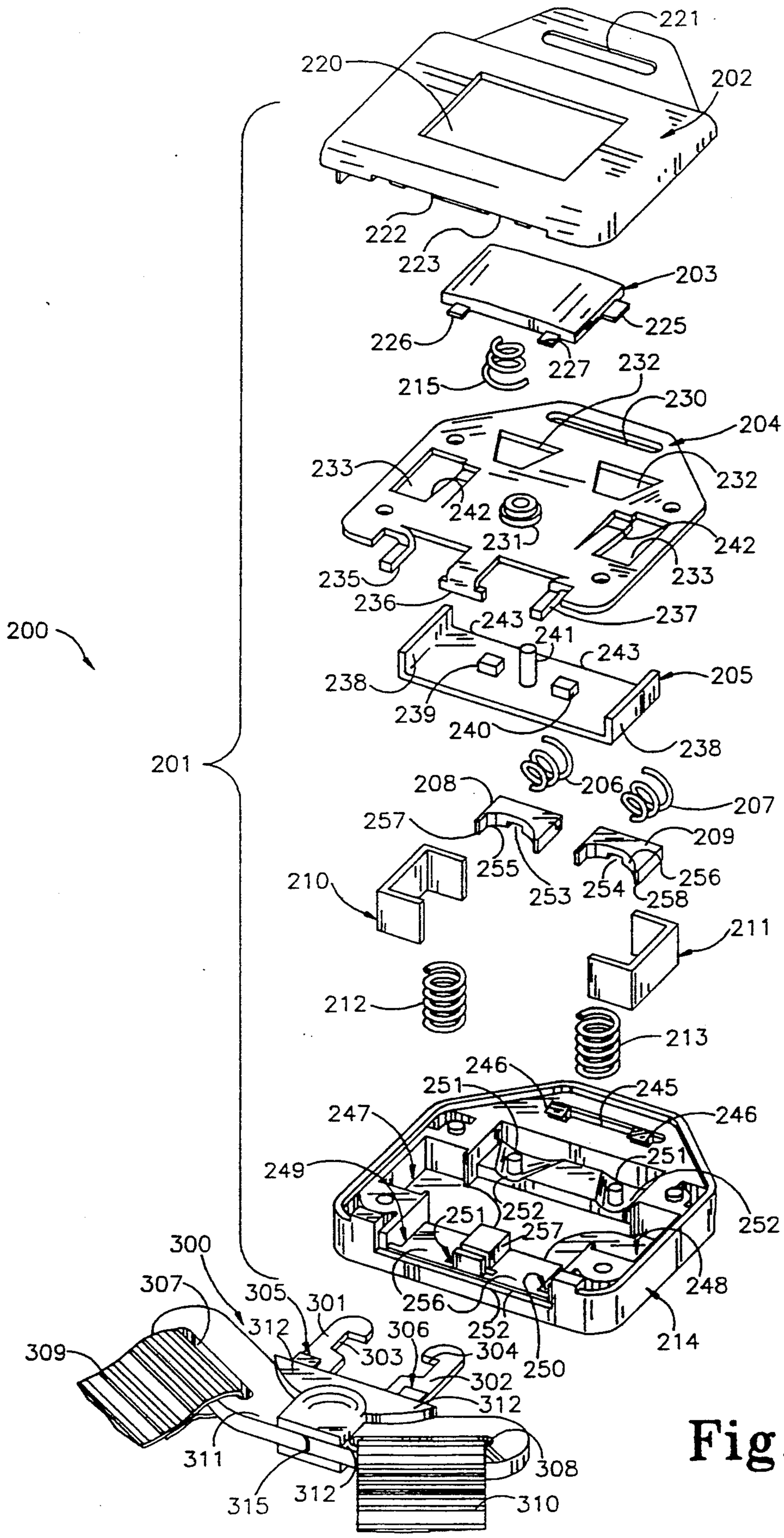
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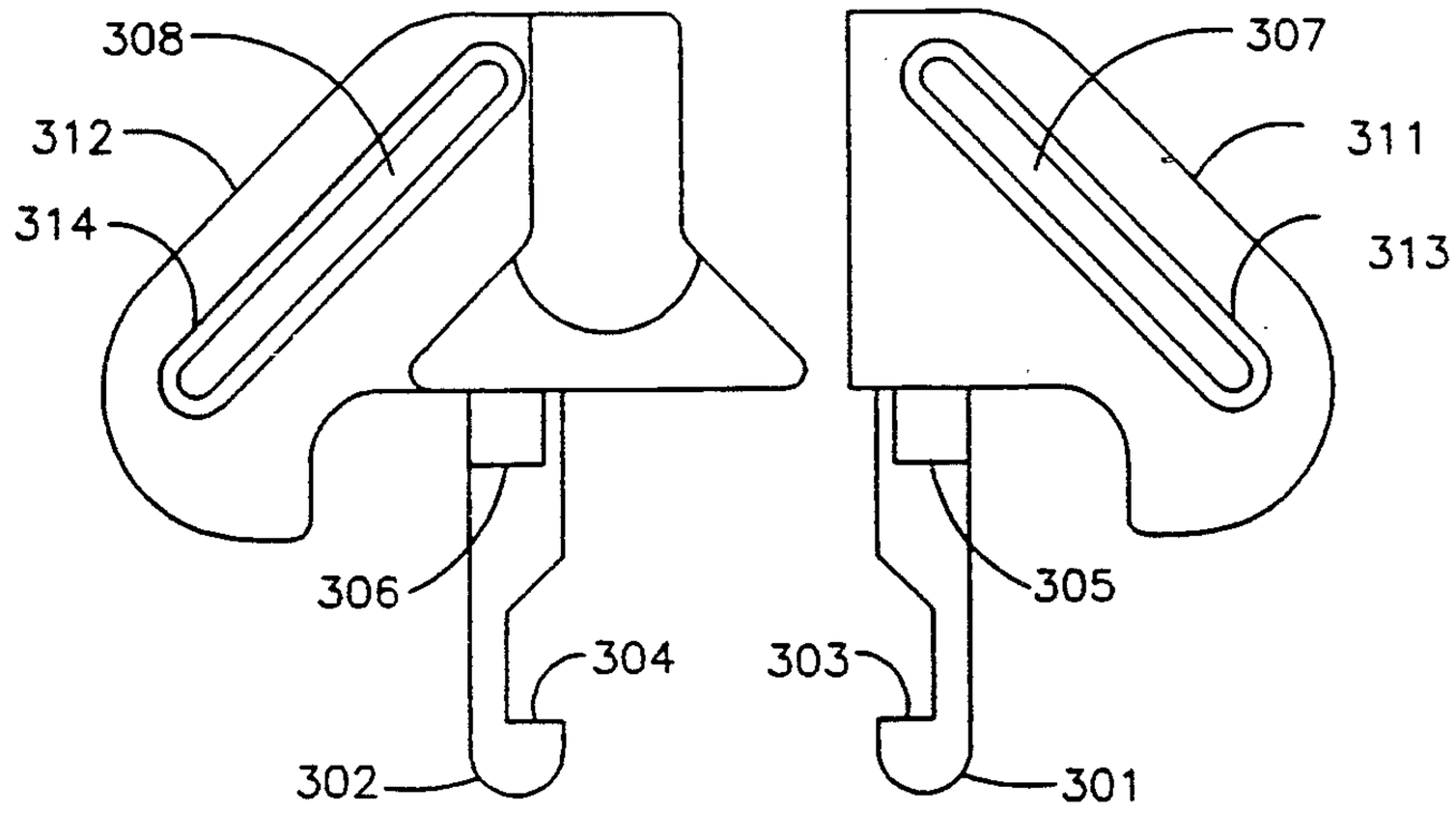
Fig.9



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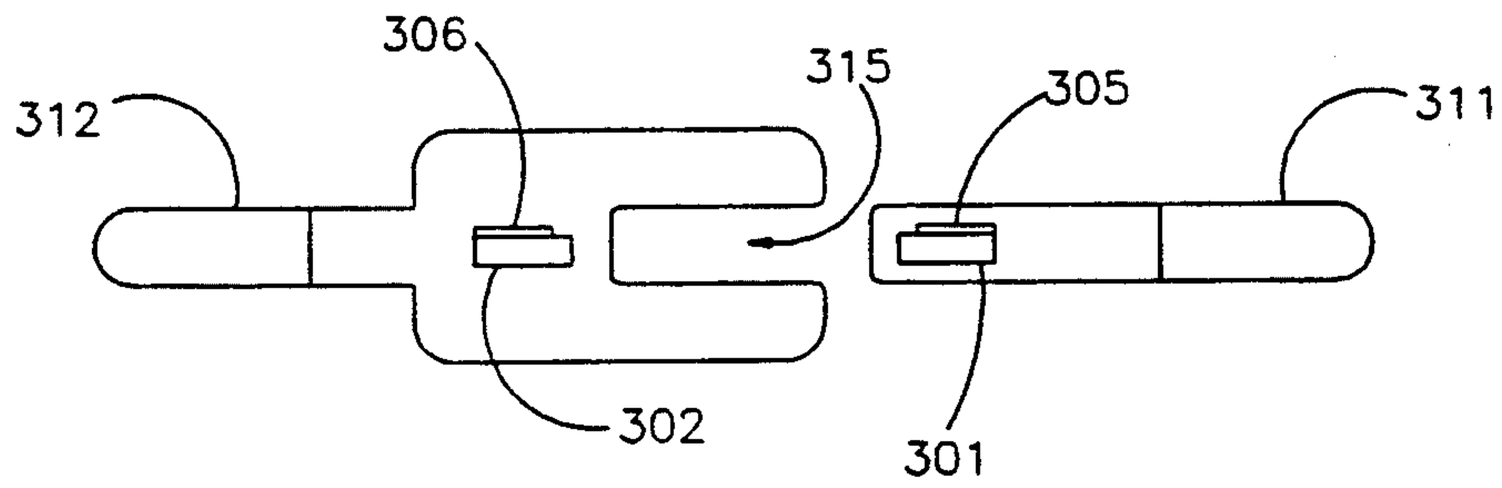

Fig.11

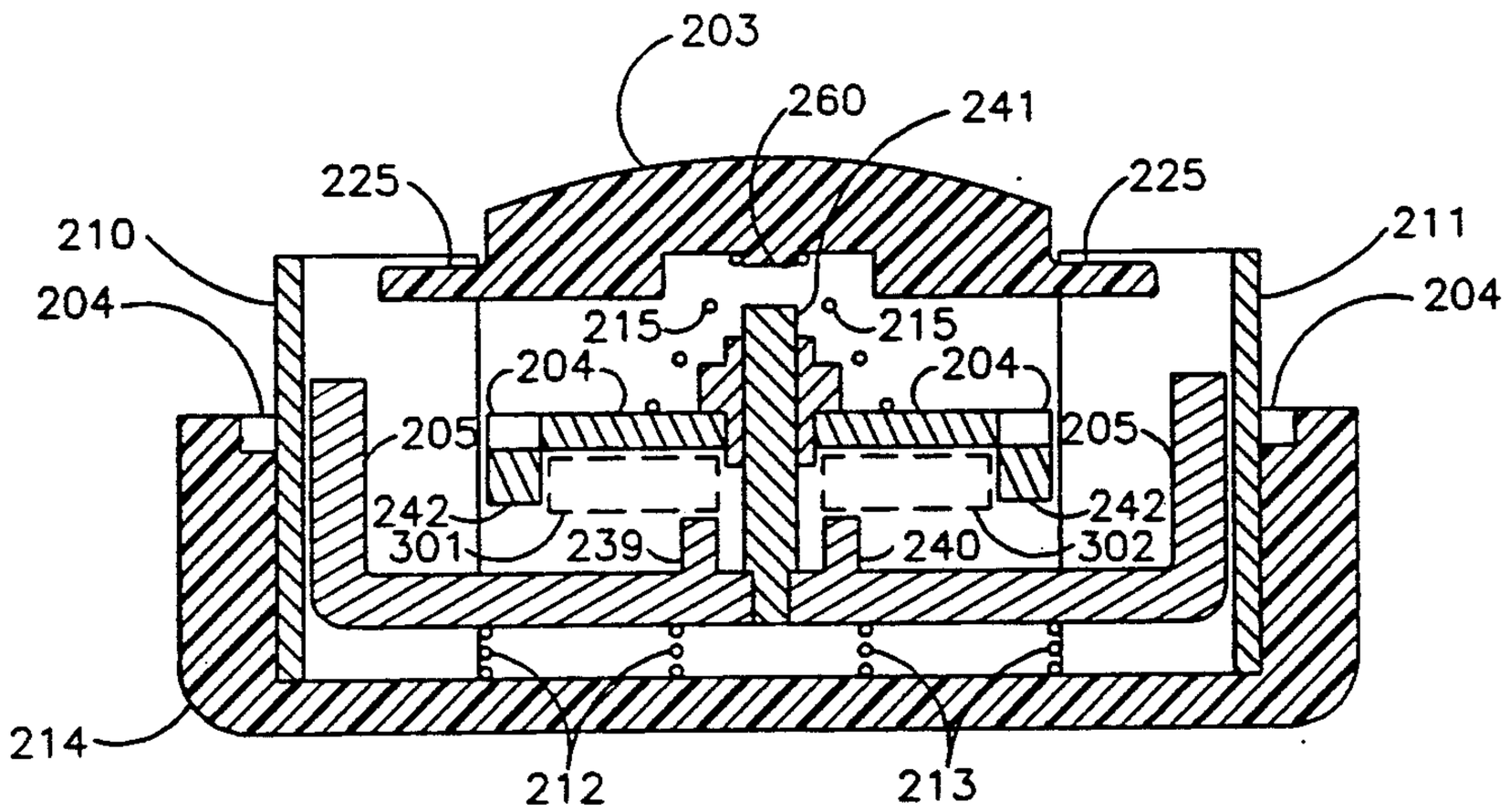

Fig.12

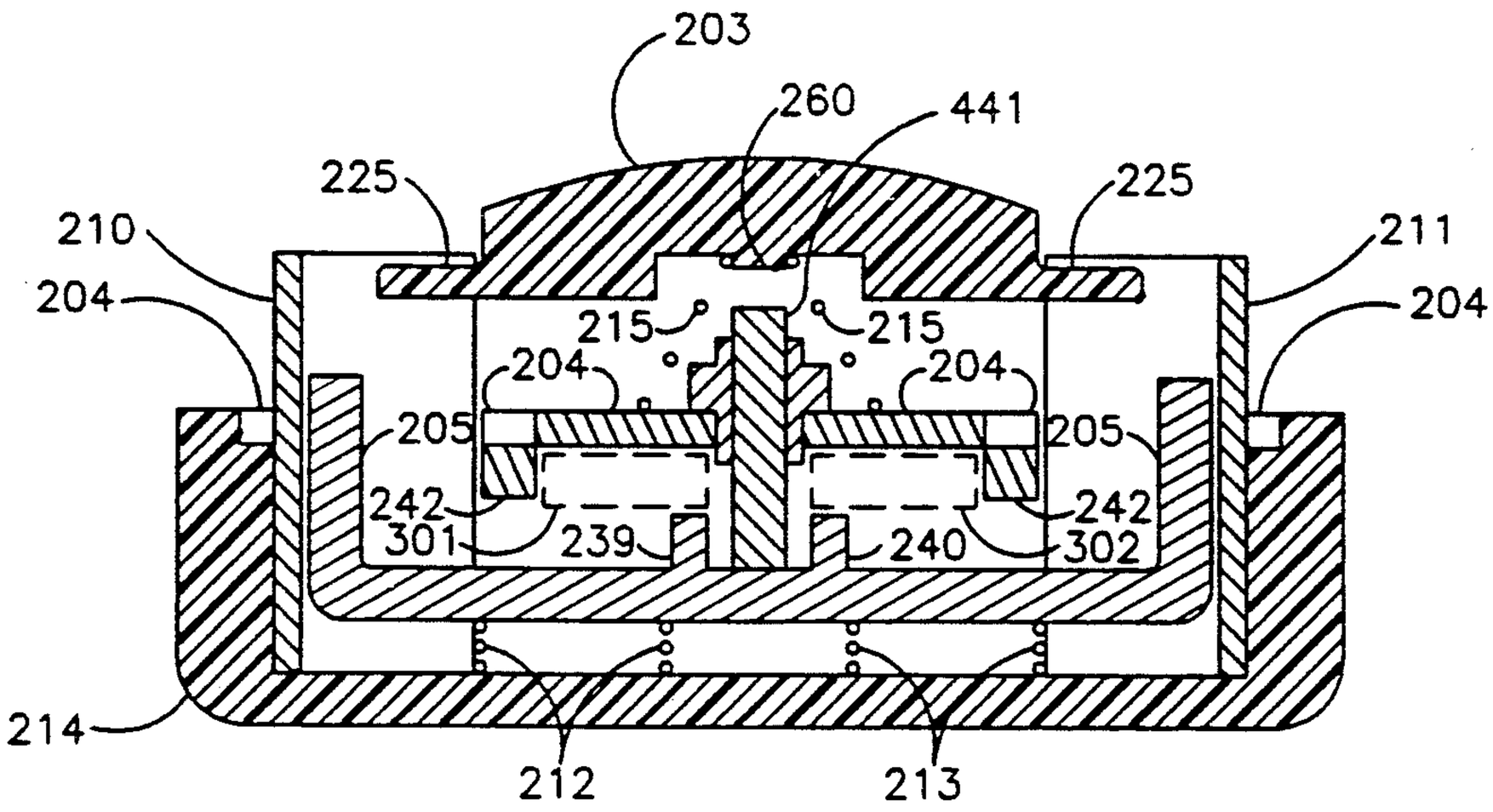
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Fig.13

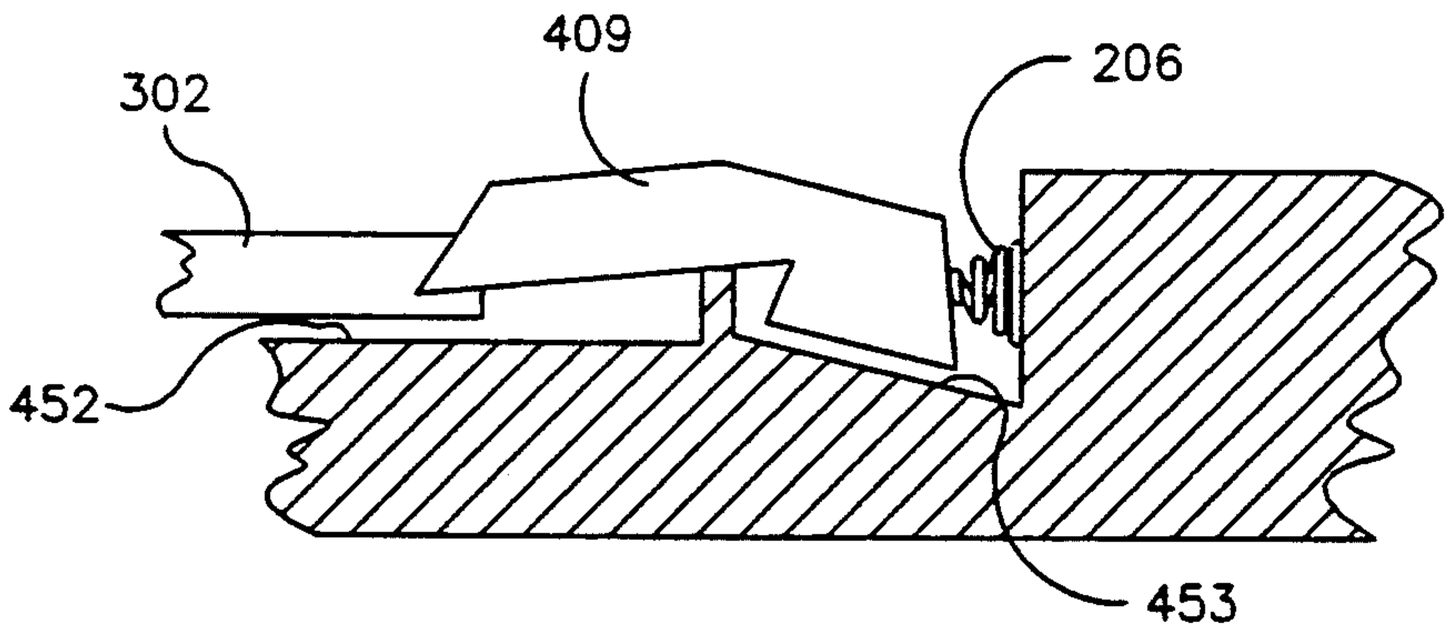
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Fig.17

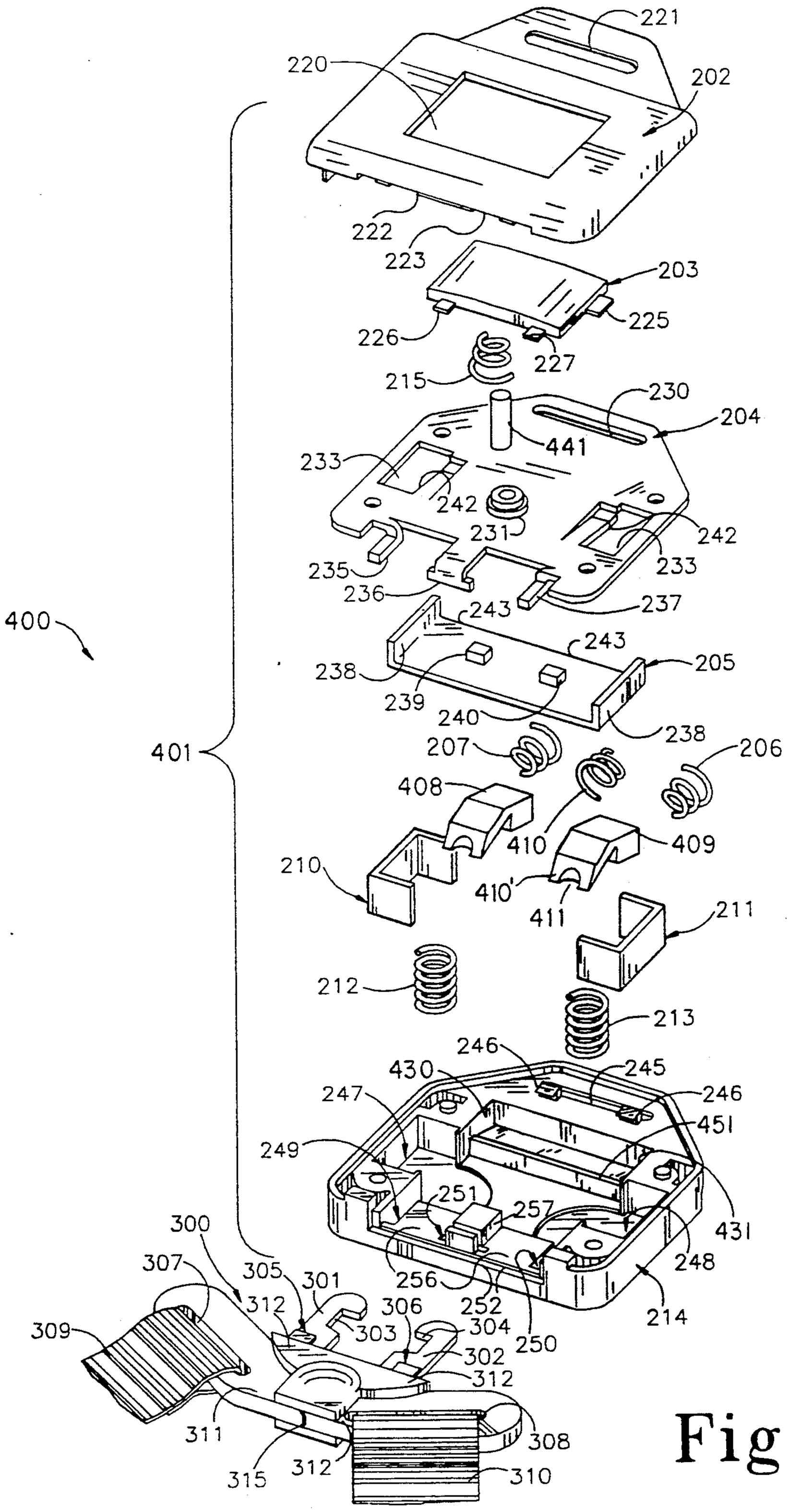
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Fig. 14

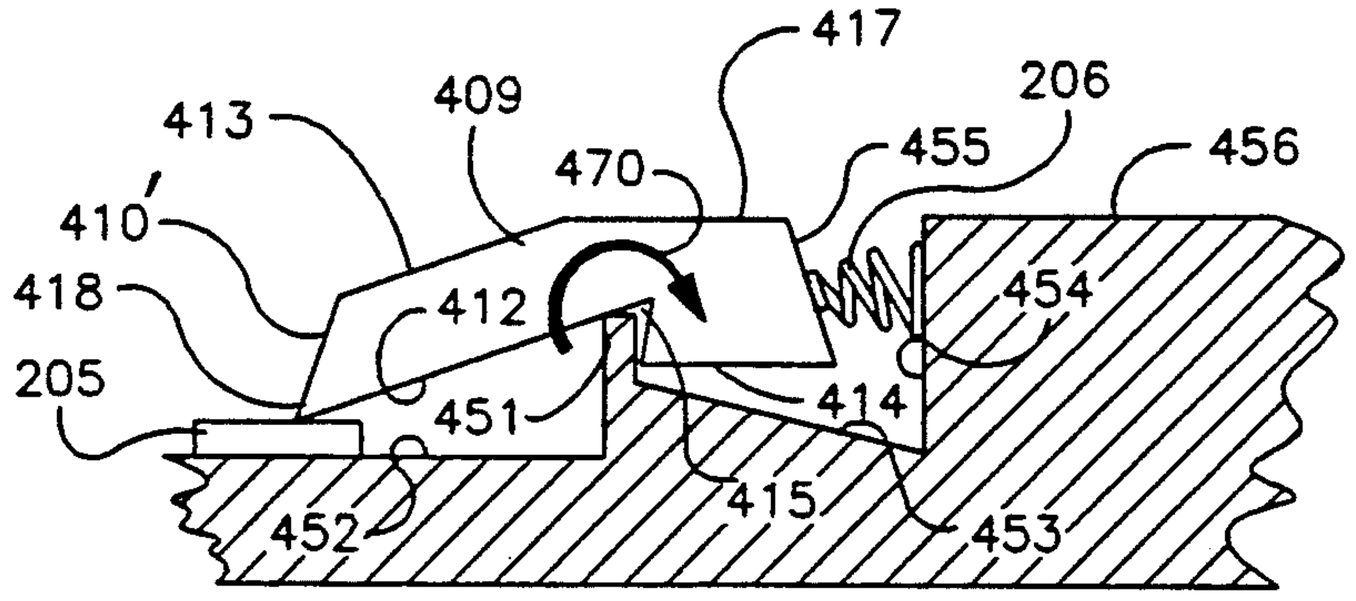
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Fig.15

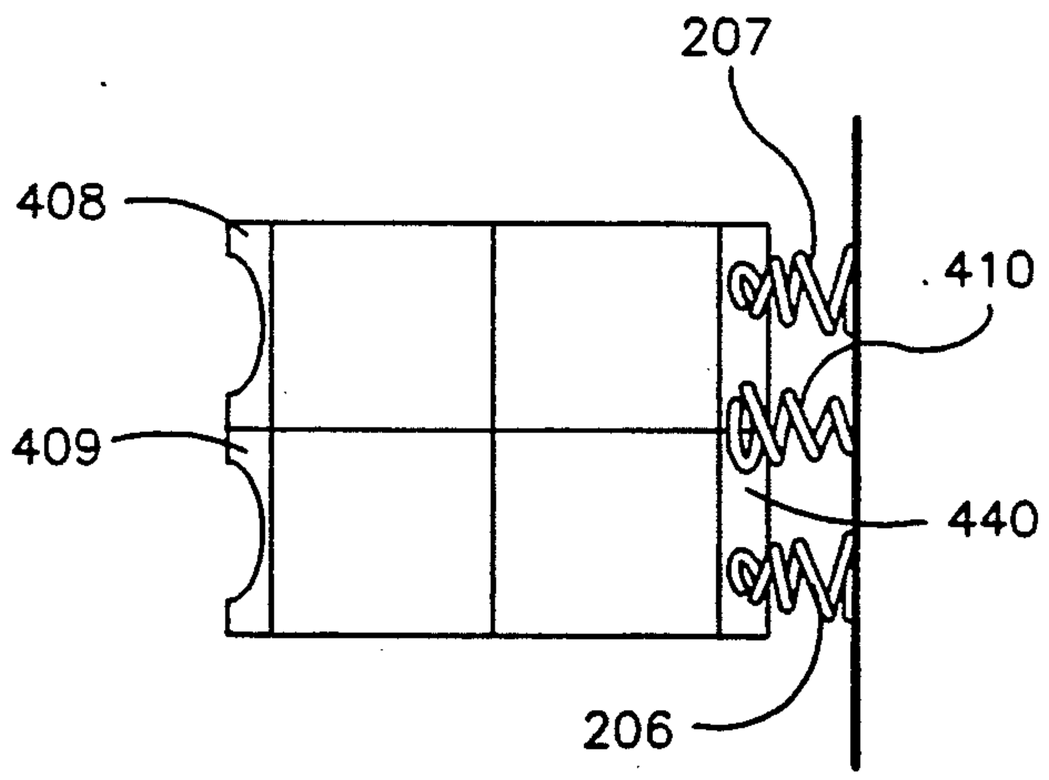
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Fig.16

BELT BUCKLE WITH INTERLOCKING DUAL TONGUE AND FLOATING PEG

REFERENCE TO RELATED APPLICATIONS

This application is a continuation-in-part of our allowed U.S. Pat. application Ser. No. 07/536,170, filed on Jun. 11, 1990, now U.S. Pat. No. 5,038,446, entitled BELT BUCKLE WITH INTERLOCKING DUAL TONGUE which is a continuation-in-part of our allowed U.S. patent application Ser. No. 370,240 filed Jun. 22, 1989, now U.S. Pat. No. 5,023,981, entitled BELT BUCKLE WITH INTERLOCKING DUAL TONGUE.

BACKGROUND OF THE INVENTION

A seat belt buckle devised to maximize holding capability as well as to improve the cost and ease of manufacture is disclosed in the U.S. Pat. No. 4,617,705 issued to James R. Anthony and Allan R. Lortz. The buckle includes a reinforcement plate mounted to and between an upper and lower housing containing a spring biased pawl engageable with a seat belt tongue. The pawl is held captive between the lower housing and the reinforcement plate, and is biased upwardly against the plate by a pair of springs. A push button is slidably mounted to the upper housing and has a pair of legs extending downwardly through the plate to contact and move the pawl downwardly to disengage the pawl from the tongue. An additional spring mounted between the push button and reinforcement plate requires force above a predetermined level to move the button downwardly and to disengage the pawl from the tongue. In many cases, the seat belt tongue is split into two separate tongues for attachment respectively to a seat belt and a shoulder harness. It is desirable to provide such a belt buckle having a pair of tongues interlockable together, but easily separable to facilitate disengagement of the belt and harness with the user.

False latching between a belt buckle and associated tongue must be avoided. In the case of a belt buckle engageable with a pair of tongues, the buckle must be designed so that it will not lockingly engage when only a single tongue is inserted into the buckle. We have therefore devised a belt buckle which will lockingly engage the tongues only when both tongues are fully inserted therein.

When utilizing a pair of tongues in combination with a buckle, it is easy to insert one or more of the tongues in an incorrect manner. For example, a tongue could be inserted upside down thereby causing twists in the seat belt or shoulder harness. We have therefore designed the interface between the tongues and buckle to allow insertion of the tongues only in the correct manner.

A further embodiment is disclosed wherein the latch activating peg is not attached to either the latch or push button allowing for less costly production. Likewise, a pair of pivoting false latching members are disclosed.

SUMMARY OF THE INVENTION

One embodiment of the present invention is a belt buckle-tongue combination including a buckle main body, a tongue insertable into and releasable lockable with the buckle main body, and a latch positioned in the main body and held captive therein. The latch is movable between a latched position with the tongue and an unlatched position and includes a guide pin attached thereto and oriented so that the axis of the pin aligns

with the direction of motion of the latch when the latch moves between the latched and the unlatched position. A first device is included which is operably associated with the latch to move the latch back and forth between the latched position and the unlatched position. A bushing mounted within the main body defines an axis of movement for the guide pin. The bushing receives the guide pin therein to confine movement of the latch along a single axis.

Another embodiment of the present invention is a belt buckle-tongue combination including, a buckle tongue of elongate shape, a buckle main body having a cavity therein to slidably receive the tongue and a movable latch including a guide pin attached thereto. The latch is mounted in the body for engaging the tongue inserted in the body. A manual operator is accessible at the exterior of the body and engaged with the latch being movable to move the latch relative to the tongue. A first spring is operable to normally apply force against the movable latch to move same into engagement with the tongue when inserted into the body in a first condition but yieldable to allow movement of the movable latch away from the tongue. A false latch device is movably mounted in the body and contactable and moved by the tongue when inserted into the body. The false latch is operable to allow the latch to lockingly engage the tongue when the tongue is in a first condition and inserted into the body and further operable to hold the latch from locking engagement with the tongue when the tongue is in a second condition.

It is an object of the present invention to provide a new and improved seat belt buckle.

A further object of the present invention is to provide a seat belt buckle operable with a pair of tongues, but which will lockingly engage the tongues only when both are inserted therein.

Likewise, it is an object of the present invention to provide a pair of seat belt buckle tongues lockingly engageable together, but easily separable apart.

An additional object of the present invention is to provide means on a seat belt buckle and associated tongues preventing the tongues from being inserted in an erroneous manner.

Related objects and advantages of the present invention will be apparent from the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an exploded, perspective view of the buckle and tongue combination of an first alternate embodiment of the present invention.

FIG. **2** is an end view of the tongue of FIG. **1** only showing the tongue separated into a pair of tongues.

FIG. **3** is a top view of the tongues shown in FIG. **2** with the tongues being separated to fully illustrate the interlocking end portions.

FIG. **4** is a cross-sectional view of the buckle of FIG. **1** with the upper housing removed therefrom.

FIG. **5** is a top view of the buckle of FIG. **1** only with the reinforcement plate and portions thereabove removed to illustrate the position of the pawl.

FIG. **6** is the same view as FIG. **5** only showing a single tongue inserted into the buckle.

FIG. **7** is an end view of the buckle of FIG. **1** showing a single inserted therein.

FIG. **8** is the same view as FIG. **7** only showing a pair of tongues inserted into the buckle.

FIG. **9** is an exploded, perspective view of the buckle and tongue combination of a second alternate embodiment of the present invention.

FIG. **10** is a top view of the tongue of FIG. **9** showing the tongue separated into a pair of tongues.

FIG. **11** is an end view of the tongues of FIG. **10** with the tongues separated to illustrate the configuration of the two tongues.

FIG. **12** is a cross-sectional view of the buckle of FIG. **9** with the cover removed and the buckle in the unlatched position and depicting the internal arrangement of the buckle with respect to the location of the inserted tongue bars.

FIG. **13** is a cross-sectional view of the preferred embodiment of the buckle of FIG. **14** with the cover removed and the buckle in the unlatched position and depicting the internal arrangement of the buckle with respect to the location of the inserted tongue bars and illustrating the floating peg.

FIG. **14** is an exploded, perspective view of the buckle of the preferred embodiment.

FIG. **15** is an enlarged and fragmentary cross-section view of the locking members with the tongue not inserted in the buckle.

FIG. **16** is a top view of the locking members of FIG. **15**.

FIG. **17** is the same view as FIG. **15** with the tongues inserted in the buckle moving the locking members rearwardly.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the embodiments illustrated in the drawings and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and further modifications in the illustrated device, and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

Referring now more particularly to FIG. **1**, there is shown the first alternate embodiment of a buckle tongue combination consisting of a buckle **11** shown in exploded view and a buckle tongue **100** consisting of a pair of interlocking, but separable, buckle tongues **101** and **102**. Buckle **11** includes a main body **14** having a mouth **13** for receiving the leading edge of tongue **100** which extends into a cavity **15** formed in main body **14**. Tongues **101** and **102** include apertures **105** and **106** through which two upraised portions **151** and **152** of pawl or latch **17** project. Tongues **101** and **102** include second apertures **107** and **108** with webs **109** and **110** extending therethrough. The two webs may represent a seat belt and harness shoulder web. A pair of helical springs **20** and **21** rest within cavity **15** and urge latch **17** to the upward position whereat the latch is locked to tongue **100**. A pair of channels **22** and **23** are secured within complementarily sized cavities **24** and **25** opening into main cavity **15**. Channels **22** and **23** slidably receive the mutually opposed and upturned arms **26** and **27** of latch **17**. The forward edge of latch **17** is split into a pair of legs **153** and **154** having an upper surface beveled downwardly to guide tongues **101** and **102** toward the upraised portions **151** and **152** of the latch which are extendable through apertures **105** and **106**. Springs **20** and **21** are positioned between the bottom wall of main body **14** forming cavity **15** and the undersurface of latch **17**. A reinforcement plate **30** is attached to main body **14** and in turn is attached to cover **31** with a push button **32** located between cover **31** and plate **30** and projectable partially through aperture **33** of cover **31** to allow the operator to depress the button thereby depressing latch **17** to the downward or unlocked position. Button **32** includes lateral extensions positioned beneath cover **31** preventing the button from escaping the buckle described in U.S. Pat. No. 4,617,705 herewith incorporated by reference. Button **32** also includes legs **53** and **54** which contact the upper surface of the latch immediately inward, respectively, of arms **26** and **27** once the button is pushed sufficiently downward to unlatch the tongues. Helical spring **161** is positioned between button **32** and plate **30** surrounding sleeve **160** and is operable to force the button upwardly, but yieldable to allow the button to be depressed thereby releasing the latch from the tongues. Spring **161** increases the positive force required to depress button **32**.

Main body **14** and cover **31** may be made from a material such as plastic and have side recess **131** and **132** formed therein. The pair of helical springs **20** and **21** rest on the upwardly facing surface of the bottom wall of main body **14** and contact the bottom surface of latch **17**. Optional pins may be used to secure the main body **14** to cover **31** and extend upwardly through plate **30**. A circumferentially extending channel may be formed in the upper edge portion of main body **14** to receive the edge of reinforcement plate **30** and a downwardly extending lip of cover **31** with the lip extending in a force fit relationship between the edge of reinforcement plate **30** and the top edge of cover **14**, all as shown and described in U.S. Pat. No. 4,617,705.

Plate **30** has a forward edge with a pair of downwardly extending legs **94** and **95** in turn having, respectively, inwardly extending portions **88** and **89**. Legs **94** and **95** are perpendicularly arranged to the plate and the distal ends which are parallel to the plate. The legs contact the upwardly facing surface of the bottom wall of housing **14** and support the plate thereatop. The legs are formed from the leading edge of the plate leaving a center portion **90** positioned therebetween which contacts an upwardly extending boss **128** integrally formed with the bottom housing **14**. Boss **128** extends upwardly to a downwardly extending projection of cover **31** dividing the mouth into a pair of mouths to receive the forwardly extending portions **103** and **104** of tongues **101** and **102**. Boss **128** has not been shown in FIGS. **7** and **8** to enable a better depiction of the indicator bottom end.

Plate **30** includes a pair of apertures **51** and **52** aligned with cavities **24** and **25** to receive the downwardly extending button legs **53** and **54** which project through the plate and movable against the top surface of the latch. A third aperture **56** is formed rearwardly of edge **44** and is aligned with aperture **57** of main body **14** and a similarly located aperture **61** of cover **31** to allow a seat belt to be attached to the buckle. A plurality of apertures **58** are located around the peripheral portion of plate **30** to receive the pins which extend through the plate and into the main body **14** and cover **13** to provide additional strengthening means securing the cover plate and main body together.

A pair of concave cavities **134** and **135** are formed in the aft portion of cavity **15** being separated by an upraised portion **133** to receive a pair of horizontally ex-

tending wire springs **138** and **139**. Both cavities **134** and **135** are tapered so that the smaller end of the cavities face forward to receive the complementary shaped tapered ends of wire springs **138** and **139**. To insure the buckle will latch only when both tongues are inserted therein, a pair of plastic anti-false latching members **136** and **137** are provided within cavity **15** being located between the rear edge **150** of latch **17** and the forward ends of springs **138** and **139**. Members **136** and **137** have forwardly opening concave surfaces **144** and **145** to respectively engage the rounded distal ends of tongue bars **103** and **104**. Each member **136** and **137** has a downwardly opening cavity **142** and **143** to receive, respectively, pins **140** and **141** which project upwardly from the bottom of cavity **15** thereby mountingly holding members **136** and **137** within the cavity. Each cavity **142** and **143** opens through, respectively, surfaces **144** and **145** to allow members **136** and **137** to slide horizontally backward compressing springs **138** and **139** when the tongues are fully inserted thereby contacting the surfaces **144** and **145**. Likewise, when the tongue bars are withdrawn from the buckle, springs **138** and **139** force members **136** and **137** horizontally in the direction of the mouth of the buckle. Members **136** and **137** each have an outwardly located side extension **146** and **149** and center extensions **147** and **148** which normally project above the upper surface of latch **17** when tongue bars **103** and **104** are not inserted into the buckle. In the event a single tongue bar is inserted into the buckle, only a single member **136** or **137** moves rearwardly thereby allowing the remaining unmoved member to project over the latch and prevent the latch from engaging the inserted tongue bar. For example, in the event tongue bar **103** is inserted into cavity **15** while tongue bar **104** remains outwardly of the buckle, the rounded distal end **140** (FIG. **6**) of tongue bar **103** will engage the downwardly beveled leg **153** of the latch eventually positioning aperture **105** immediately over projection **151**. Simultaneously, tongue bar **103** will engage concave surface **144** and move member **136** rearwardly thereby moving projections **146** and **147** away from latch **17**. Projections **148** and **149** of member **137**, however, will remain above latch **17** preventing the latch from moving upwardly by the force of helical springs **20** and **21** and thereby preventing upraised latch portion **151** from entering opening **105**. The upper edge **199** (FIG. **6**) of concave surface **146** is located above the top surface of tongue bar **103**.

The buckle push button is provided with an indicator for clearly illustrating when the buckle is lockingly engaged with both tongues. The central portion of button **32** (FIG. **4**) is provided with a counter bored hole to receive indicator **172**. The stem **173** of the indicator extends freely through button **32** and has a head **174** integrally formed thereon which is complementarily received in the counter bore recess of the button aperture. The upper surface of head **174** is smoothly contoured to blend into the convex upwardly facing surface of button **32** when the button is in the retracted position corresponding to indicating the buckle is not lockingly engaged with both tongues. Stem **173** extends through a upwardly projecting sleeve **160** (FIG. **4**) fixely mounted to the center portion of upwardly facing surface **171** of reinforcement plate **30**. Stem **173** projects through sleeve **160** and the reinforcement plate towards latch **17**. An enlarged rounded bottom end **176** is mounted to stem **173**. A projection, such as a washer **190** is fixedly mounted to stem **173** supporting a helical spring **191** thereatop which has a top end engaging the bottom surface of button **32**. Spring **191** is operable to urge button head **174** downwardly into the button counter bored recess, but is yieldable to allow the head **174** to extend above the button **32** once latch **17** moves upwardly to the latched condition thereby forcing bottom end **176** of the indicator upwardly. End **176** is larger than the inside diameter of sleeve **160** to prevent the indicator from escaping the buckle and may be affixed to stem **173** once the stem is inserted through sleeve **160**. Center projections **147** and **148** (FIG. **1**) have distal concave shaped ends forming a partial semi-circular cavity to prevent any interference with bottom end **176** of the indicator. A pair of apertures **155** and **156** (FIG. **1**) are provided to prevent interference between the plate, helical springs **138** and **139** and upraised latch portions **151** and **152**.

When the tongue bars **103** and **104** are not inserted into the buckle, the top surface of indicator head **174** is flush with the upwardly facing surface of button **32**. Once both tongue bars **103** and **104** are inserted into the buckle and are lockingly engaged with upraised latch portions **151** and **152**, latch **17** moves to the upward position (FIG. **8**) compressing spring **191** and moving stem **173** upward until head **174** projects above the upwardly facing surface of button **32**. An indication is therefore provided that the buckle is lockingly engaged with the buckle tongues. To disengage the buckle with the tongues, buckle **32** is moved downwardly thereby forcing latch **17** downwardly disengaging the upraised latch portions with the tongue bars.

Buckle tongue **100** consists of two interlockable, but separable tongues **101** and **102** each having fixedly mounted thereto in cantilevered fashion tongue bars **103** and **104**. Tongue bars have respectively D-shaped apertures **105** and **106** with the flat portion of the D-shaped hole being located adjacent the rounded distal ends of the tongue bar to engage the upraised latch portions **151** and **152**. Tongue bars **103** and **104** are provided with upraised portions **114** and **115** adjacent their proximal ends with the upraised portions **114** and **115** being complementarily shaped to fit into, respectively, recesses **129** and **130** formed in the top cover **31**. Thus, if the tongue bars **103** and **104** are turned upside down, then upraised portions **114** and **115** will not fit into recesses **129** and **130**, and instead will contact the outwardly facing surface of housing **14** adjacent the buckle mouth preventing full insertion of the tongue bars and thereby preventing engagement of recesses **105** and **106** with upraised latch portions **151** and **152**.

Tongues **101** and **102** (FIGS. **2** and **3**) have overlapping walls **117** and **116**, respectively, which extend over and adjacent the other tongue. For example, tongue **101** includes wall **117** which extends outwardly of and adjacent tongue **102**, whereas wall **116** integrally attached to tongue **102** extends outwardly and adjacent tongue **101**. Walls **116** and **117** are provided, respectively, with projections **118** and **119** which fit into complementarily sized apertures provided in the outwardly facing surface of each tongue. For example, tongue **101** includes aperture **120** which releasably receives projection **118** of wall **116**. Likewise, projection **119** which extends upwardly from surface **121** of wall **117** extends into an aperture provided in the downwardly facing surface of tongue **102** as viewed in FIG. **2**.

The mutually facing surfaces **124** and **125** of tongues **102** and **101** are at an angle relative to the vertical axis as shown in FIG. **2** facilitating the sliding together of

the tongues and the eventual extension of projections **118** and **119** into the adjacent apertures provided in the tongues.

Wall **116** integrally attached to tongue **102** has a downwardly facing surface with a pair of finger depressions **122**. Likewise, wall **117** attached to tongue **101** has an upwardly facing surface **123** (FIG. **1**) with a single thumb depression **111** formed therein enabling the user to grasp the pair of tongues by placing the user's thumb in depression **111** and the second and third fingers of the hand in depressions **122**. A heart-shaped upraised portion **113** is formed on the upper surface of tongues **101** and **102** to provide an indication of which side of the tongues should face upwardly. Upraised portion **113** is divided in half along the tongue mating line **112** which is aligned with mating surfaces **124** and **125** of the tongues.

Referring now to FIG. **9**, the second alternate embodiment of the belt buckle with interlocking dual tongue **200** according to the present invention is shown. An exploded perspective view of the buckle **201** is shown in FIG. **9** detailing the component parts internal within buckle **201**. The buckle **201** and dual tongue **300** include the anti-falsing latching function described in conjunction with the embodiment shown in FIGS. **1–8**. The latching indicator of the previous embodiment is not included in the embodiment of FIGS. **9–12**. However, an improved latching pawl having a guide pin attached thereto is included in the embodiment of FIGS. **9–12** to enhance the operation of and encourage smooth latching and unlatching of the buckle **201** and dual tongue **300**.

Buckle **201** includes the following component parts: cover **202**, push button **203**, reinforcement plate **204**, pawl or latch **205**, anti-falsing latching members **208** and **209**, channels **210** and **211**, main body **214**, and springs **215**, **206**, **207**, **212** and **213**.

Cover **202** includes an aperture **221** for receiving a web commonly used in a seat belt harness (not shown). Aperture **220** is shaped to receive push button **203** from the underside. Tabs **225** on the opposite sides and tabs **226** and **227** on the opposite ends of the push button contact the underside of cover **202** and retain push button **203** within aperture **220**. Spring **215** is located over bushing **231** and upwardly biases push button **203** into aperture **220**.

Reinforcement plate **204** includes aperture **230** which aligns with aperture **221** thereby allowing the web material to pass therethrough. Apertures **232** are designed to receive and retain springs **206** and **207** once springs **206** and **207** are positioned behind anti-falsing latching members **208** and **209**, respectively, in channels **252** of main body **214**. Apertures **233** are shaped to receive channels **210** and **211**. Guide members **242**, formed by shearing and bending portions of plate **204** provide lateral guides for tongue bars **301** and **302** when the bars are inserted into the buckle **201** along surfaces **256**. Plate **204** includes locating tabs **235**, **236** and **237** formed integrally with plate **204**. Tabs **235**, **236** and **237** are received in slots **249**, **251** and **250** respectively, of main body **214** when plate **204** is positioned into main body **214**.

Pawl **205** includes horizontal rising portions **238** sized to coincide with channels **210** and **211**. Thus, pawl **205** can move vertically yet is restricted horizontally by channels **210** and **211**. Locking tabs **239** and **240** coincide with and engage cutouts **303** and **304** of tongue bars **301** and **302**, respectively, when pawl **205** is spring biased upwards by springs **212** and **213**. In order for pawl **205** to move upwards within channels **210** and **211**, anti-falsing latching members **208** and **209** must be horizontally moved by tongue bars **301** and **302** thereby allowing pawl **205** to move vertically. Members **208** and **209** are spring biased horizontally by springs **206** and **207**, respectively. Pawl **205** is retained in an unlocked position as shown in FIG. **12** by members **208** and **209** which physically engage pawl **205** and prevent movement of pawl **205** in a vertical direction. Essentially, the anti-falsing mechanism of this embodiment of the present invention functions identically as the buckle shown in FIGS. **1–8**. Pawl **205** also includes guide pin **241** which is press fitted into pawl **205**. Pin **241** extends upwardly through bushing **231** so that push button **203** may contact pin **241** thereby moving pawl **205** downward to unlatch the buckle **201** and tongue **300**. Guide pin **241** prevents pawl **205** from assuming a position which is askew from the plane of the plate **204**. Thus, latching and unlatching of the individual tongue bars **301** and **302** occurs simultaneously as a result of the well defined linear movement of pawl **205** in the direction of the cylindrical axis of the guide pin **241** retained and guided by bushing **231**.

Main body **214** includes cavities **247** and **248** for receiving channels **210** and **211**, locating pins **251** and cavities **252** for receiving springs **206** and **207**. Pins **251** coincide with apertures **253** and **254** to limit horizontal movement of members **208** and **209**. The front or leading edge **257** and **258** of members **208** and **209**, respectively, engages pawl **205** to prevent movement of pawl **205** when members **208** and **209** are spring biased toward the tongue **300** over the upper rear edge **243** of pawl **205** and pawl **205** is lowered as a result of operator depression of push button **203** into an unlatched position.

Clips **246**, integrally molded with main body **214**, provide a latching mechanism to hold plate **204** within main body **214**. Clips **246** pass through aperture **230** of plate **204** and retain plate **204** in position.

When positioned in the main body **214**, plate **204** provides a channel defined by tabs **235** and **237** in conjunction with surfaces **256** and **257** into which tongue bars **301** and **302** are inserted. Bevelled edge **252** assists in guiding tongue bars **301** and **302** into the appropriate apertures of buckle **201**. Aperture **245** of main body **214** aligns with apertures **230** and **221** to allow webbing to pass therethrough.

Upon insertion into the belt buckle, the forward rounded distal ends of tongue bars **301** and **302** engage concave surfaces **255** and **256** of members **208** and **209**, respectively, and move members **208** and **209** rearwardly into the main body **214**. Once members **208** and **209** are moved by tongue bars **301** and **302** pawl **205** is released from the unlatched position thus enabling pawl **205** to move upwards as a result of forces from springs **212** and **213** within channels **210** and **211**. Upon rising upwards, tabs **239** and **240** will engage cutouts **303** and **304**, respectively, thereby retaining the dual tongue assembly **300** in the buckle **201**. As with the previously described embodiment, unless both members **208** and **209** are simultaneously engaged by both tongue bars **301** and **302**, the anti-falsing latching members retain pawl **205** in the unlatched position and springs **206** and **207** act to eject any inserted tongue bar.

Web **309** is received within aperture **307** of tongue portion **311**. Web **310** is received in aperture **308** of tongue portion **312**. Tongue **311** resides in a U-channel

315 formed or molded into in tongue 312. Tongue guides 305 and 306 mate with and are received in apertures 222 and 223 of cover 202 so that the dual tongue 300 cannot be inverted or rotated 180 degrees and inserted into the buckle 201.

Cover 202, push button 203, and main body 214 can be formed or manufactured using plastic materials. Reinforcement plate 204 is preferably made of steel or other metal suitable for providing strong reinforcing strength. Pawl 205 and locating pin 241 are made of steel or other suitable material. Bushing 231 is made of nylon. Channels 210 and 211 are made of metal. Anti-falsing latching members 208 and 209 may be made of plastic, nylon or other suitable material.

Dual tongue 300 includes two metallic portions 313 and 314 (FIG. 10) comprising the tongue bars 301 and 302, respectively. The metallic portion 313 and 314 provide reinforcement for the plastic molded over the metallic portions 302 and 314 of tongue 312. Reinforcement for tongue 311 is provided by the metal portion 313 which includes tongue bar 301. Cutouts 303 and 304 receive pins 239 and 240, respectively, of pawl 205 when the tongue 300 is inserted into the buckle 201 and the buckle latches onto the tongue and retains it therein until released by a depression of push button 203. Cutouts 303 and 304 are symmetrically opposed narrowed portions of tongue bars 301 and 302, respectively, wherein the tongue bars are approximately one half their broadest width. One edge of each cutout, 303 and 304, is formed along a line which is perpendicular to the direction of insertion of the tongue into the buckle, thereby providing a surface for pins 239 and 240 to act against for applying a retaining force to the tongue bars 301 and 302 when the buckle latches.

As shown in FIG. 11, tongue 311 is shaped to be laterally received into U-shaped channel 315 of tongue 312 thereby positioning tongue bars 301 and 302, respectively, in proper location so as to be received within the channels defined by surfaces 256, 257 and tabs 235 and 237. Also shown in FIG. 11 are guide members 306 and 305 which prevent inversion of the tongue when inserted into the buckle 201.

Referring now to FIG. 12, a cross-sectional view of buckle 201 is shown. Actuator tab 260 of push button 203 is shown. Tab 260 contacts pin 241 when the pawl 205 and pin 241 assembly are allowed to move upwardly (i.e. when the buckle "latches") when the anti-falsing latching members 208 and 209 (not shown in FIG. 12) are moved rearwardly by tongue bars 301 and 302. Plate 204, which includes guide members 242 formed integrally from plate 204, provides an additional guide for positioning tongue bars 301 and 302 properly within the cavity defined thereby. Upon moving vertically upwards, pawl 205 and latching pins 239 and 240 will engage the cutouts 303 and 304 (see FIG. 10) of tongue bars 301 and 302, respectively, as a result of the upward spring force provided by springs 212 and 213. Once vertically positioned in the "latch" position, pin 241 will contact tab 260 located on the underside of push button 203. Pin 241 is shoulder mounted and press fitted into pawl 205 to provide centralized moving force when a user depresses push button 203 to "unlatch" the tongue bars from latching pins 239 and 240. The spring force provided by springs 206 and 207, as in the earlier embodiment, enables members 208 and 209 to eject tongue bars 301 and 302 when one tongue bar is individually inserted the pawl 205 is in the unlatched position. Tabs 225 are retained within channels 210 and 211 to prevent push button 203 from rotating about the actuator tab 260, and thereby retaining push button 203 in a proper position coincident with aperture 220. Spring 215 provides a resilient upward force to the underside of push button 203.

Referring now more particularly to FIG. 14, there is shown an exploded perspective view of the preferred embodiment of the belt buckle with interlocking dual tongue 400 according to the present invention. The combination includes the interlocking dual tongue 300 previously described and illustrated. The buckle 401 is identical to buckle 201 with the main exceptions of the design of the guide pin previously mounted to the latch and the design of the two anti-false latching members. Thus, the identical components of FIGS. 9 and 14 identified by the same component numbers will not be further described it being understood that the description of the alternate embodiment of FIG. 9 is applicable to those components of FIG. 14.

Guide pin 241 (FIG. 9) has been eliminated from the preferred embodiment and replaced by a floating peg 441 (FIG. 13) which extends freely through and is slidable within bushing 231 mounted to reinforcement plate 204. The diameter of peg 441 is slightly less than the internal diameter of the hole formed by bushing 231 thereby allowing the bushing to guide peg 441 in a straight line along the peg's longitudinal axis but a the same time allowing the peg to freely slide within the bushing. The length of peg 441 is slightly less than the distance between the upper surface of latch 205 and the downwardly facing surface of actuator tab 260 of push button 203 when the latch is in the upward position and unlocked with respect to the tongues. By depressing push button 203, the actuator tab 260 contacts the top end of floating peg 441 thereby forcing the peg downwardly against the latch 205. The latch includes the upwardly extending portions 238 which slide within channels 210 and 211 thereby moving the latch to the downward position to disengage the latch from the pair of tongues located within the buckle.

The anti-false latching members 208 and 209 (FIG. 9) have been replaced by anti-false members 408 and 409 (FIG. 14). Members 408 and 409 pivot and slide to and from the tongues as compared to the non-pivoting but sliding members 208 and 209. A third spring 410 has been positioned between springs 206 and 207. Locating pins 251 and cavities 252 (FIG. 9) have been deleted to accomodate the design of the new anti-false latching members 408 and 409. A ridge 451 (FIG. 14) extends perpendicularly and upward from the bottom surface 452 (FIG. 15) of the main cavity of buckle main body 214. The buckle includes an upwardly facing slanted surface 453 which extends from ridge 451 and then downwardly toward vertical surface 454. Springs 206, 207 and 410 are positioned between the rearward surface 455 of the anti-false latching members 408 and 409 and the vertical surface 454 of the buckle main body. Plate 204 is mounted atop the upwardly facing surface 456 of buckle main body retaining therebeneath the pair of members 408 and 409 along with springs 206, 207 and 410. Apertures 232 provided in plate 204 as shown in the embodiment for FIG. 9 are deleted in the embodiment of FIG. 14 so that the plate retains therebeneath the three springs.

Member 409 will now be described it being understood that an identical description applies to member 408. The main body of member 409 includes a forward beveled surface 410' with a radius cut out portion 411

(FIG. 14) formed thereon which is complimentary in shape to the forward nose or edge of tongue bar 302. Beveled surface 410' extends rearwardly from bottom surface 412 (FIG. 15) which is parallel to upper surface 413. Bottom surface 412 is inset upwardly from a second bottom surface 414 of the locking member forming a cutout portion 415 which sets atop ridge 451 allowing the member to pivot and slide rearwardly. The rear surface 455 of locking member 409 extends upwardly and forwardly from bottom surface 414 which is parallel to upper surface 417.

When the tongues are not inserted into the buckle, the forward edge 418 of both members 408 and 409 rest atop latch 205 (FIG. 15) retaining the latch in the downward position. Members 408 and 409 are mounted in the buckle main body in a side by side relationship as shown in FIG. 16. The upright surfaces 430 and 431 (FIG. 14) of main body 214 retain members 408 and 409 in a side by side relationship. Helical wire springs 206 and 207 have their enlarged ends resting against vertical surface 454 of the buckle main body whereas the small ends of springs 206 and 207 contact and rest against rear surface 455 of respectively members 409 and 408. Helical wire spring 410 is reversed so that the enlarged end 440 (FIG. 16) contacts simultaneously rear surface 455 of both members 408 and 409. The smaller end of spring 410 therefore rests against and contacts vertical surface 454. Superior pivoting and sliding motion has been achieved by reversing the position of helical spring 410 as compared to springs 206 and 207 as depicted in FIG. 16.

As in the embodiment of FIG. 9, insertion of a single tongue into the buckle depicted in FIG. 14 will result in rearward motion of only a single locking member 408 or 409 thereby allowing the remaining member to retain the latch in the downward position preventing false latching. Upon insertion of both tongues, members 408 and 409 will pivot clock-wise as viewed in FIG. 15 and slide rearwardly thereby uncovering latch 205 and allowing the latch to move upwardly to lockingly engage the tongues. Prior to insertion of the tongues into the buckle, bottom surface 412 (FIG. 4) extends downwardly from the top of ridge 451. As both tongues are inserted into the buckle to contact members 408 and 409, bottom surface 412 of each member rides upwardly on ridge 451. Since upward movement of both members 408 and 409 is limited by the presence of plate 204, the members are caused to pivot in the direction of arrow 470 with bottom surface 414 of the members contacting and sliding rearwardly on the downwardly sloping surface 453 of the buckle main body. Further movement of the tongues into the buckle results in the members 408 and 409 moving rearwardly to the position illustrated in FIG. 17 wherein the latch is allowed to move upwardly lockingly engaging the tongues.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only the preferred embodiments have been shown and described and that all changes and modifications that come within the spirit of the invention are desired to be protected.

What is claimed is:

1. A belt buckle-tongue combination comprising:

a buckle main body;

tongue means insertable along a plane into said buckle main body with said tongue means releasable lockable with said buckle main body;

a latch positioned in said main body and held captive therein, said latch movable in a linear direction between a latched position with said tongue means and an unlatched position;

a floating peg slidably mounted to said main body and oriented so that the axis of said peg is aligned with the direction of linear motion of said latch when said latch moves between said latched and said unlatched position;

first means operably associated with said peg and said latch to move said peg to move said said latch back and forth between said latched position and said unlatched position; and

guide means mounted within said main body for defining an axis of movement for said peg and limiting movement of said latch, said guide means receiving said peg therein to confine movement of said peg along a single axis and limit said latch from assuming a position askew to said plane.

2. The combination of claim 1 including false latching means movably mounted in said body and contactable and moved by said tongue means when inserted into said body, said false latching means being operable to allow said latch to lockingly engage said tongue means when said tongue means is in a first condition and inserted into said body and further operable to hold said latch from locking engagement with said tongue means when said tongue means is in a second condition.

3. The combination of claim 2 wherein said body includes an upwardly facing ridge, said false latching means includes a pair of spring biased members with a downwardly facing slanted surface contacting said ridge and pivotally and slidably mounting said members upon said ridge.

4. The combination of claim 3 wherein said false latching means includes a pair of springs contacting respectively each of said pair of spring biased members urging said members toward said tongue means, said false latching means further includes an intermediate spring located between said pair of springs contacting both of said members when said tongue means is located external of said buckle main body.

5. A belt buckle-tongue combination comprising:

buckle tongue means of elongate shape extending in a plane;

a buckle main body having a cavity therein to slidably receive said tongue means;

a movable latch mounted in said body and movable in a linear direction for engaging said tongue means inserted in the body;

a peg slidably mounted in said main body;

manual operating means accessible at the exterior of the body and engagable with said peg being movable to move said peg and said latch in said linear direction and relative to said tongue means;

bushing means within said main body for defining an axis of movement in said linear direction for said peg, said bushing means receiving said peg to confine movement of said peg along a single axis to limit motion of said latch relative to said plane;

first spring means being operable to normally apply force against said movable latch to move same into engagement with said tongue means when inserted into the body in a first condition but yieldable to

allow movement of said movable latch away from said tongue means; and

false latching means movably mounted in said body and contactable and moved by said tongue means when inserted into said body, said false latching means being operable to allow said latch to lockingly engage said tongue means when said tongue means is in a first condition and inserted into said body and further operable to hold said latch from locking engagement with said tongue means when said tongue means is in a second condition.

6. The combination of claim **5** wherein said peg includes a longitudinal axis extending upwardly from said plane with said peg resting atop but being separate from said latch, said peg extending to a position beneath but spaced apart from said manual operating means when said tongue means is located external of said main body, said manual operating means operable to contact said peg when depressed and force said peg downwardly to move said latch downwardly.

7. The combination of claim **6** wherein said false latching means includes a first member and a second member pivotally and slidably mounted within said main body, said false latching means further including a plurality of springs located between said main body and said first member and said second member which are in a side by side relationship.

8. The combination of claim **7** wherein said main body includes a ridge supporting said first member and said second member.

9. A belt buckle tongue combination comprising:

buckle tongue means of elongate shape;

a buckle main body having a cavity therein to slidably receive said tongue means;

a movable latch mounted in said body for engaging said tongue means inserted in the body;

manual operating means accessible at the exterior of the body and being movable to move said latch relative to said tongue means;

first spring means being operable to normally apply force against said movable latch to move same into engagement with said tongue means when inserted into the body in a first condition but yieldable to allow movement of said movable latch away from said tongue means; and,

false latching means movable mounted in said body and contactable and moved by said tongue means when inserted into said body, said false latching means being operable to allow said latch to lockingly engage said tongue means when said tongue means is in a first condition and inserted into said body and further operable to hold said latch from locking engagement with said tongue means when said tongue means is in a second condition and wherein:

said tongue means includes a pair of tongues;

said false latching means contacts and holds said latch from locking engagement when only one of said tongues is inserted into said main body; and

said false latching means includes a first member, a second member, and member spring means with said member spring means normally urging said first member and said second member against said latch but yieldable to allow said first member to pivotally and slidably move away from said latch when contacted and moved by one of said tongues while said second member remains against said latch holding same away from locking engagement until contacted and pivotally and slidably moved by the other of said tongues away from said latch allowing said latching means to move into locking engagement with said pair of tongues.

10. The combination of claim **9** wherein said main body includes a housing and a cover removably mounted to said housing and further includes a push button slidably mounted to said cover and operably associated with said latch, said cover and said main body form a tongue receiving cavity with said latch projecting into said cavity to lock said tongues inserted therein.

11. The combination of claim **10** wherein said first member and said second member overlap said latch when said tongues are located external of said buckle main body but pivot and slide apart from said latch when said tongues move over said latch and contact said first member and said second member.

12. The combination of claim **11** wherein said main body includes a upwardly extending projection atop of which said first member and said second member are pivotally and slidably supported, said main body further includes an upwardly facing surface aft of said projection which extends downwardly therefrom defining a support upon which said first member and said second member slide as said tongues contact and move said first member and said second member.

13. The combination of claim **12** wherein said first member and said second member each include a downwardly facing surface located forward of said projection when said tongues are located external of said buckle with said downwardly facing surface slanting downwardly from said projection toward said latch, said downwardly facing surface slidable on said projection when said tongues contact and move said first member and said second member.

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